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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/592,575	06/12/2000	Atsushi Makino	Q59679	4629

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EXAMINER	
FAULK, DEVONA E	
ART UNIT	**PAPER NUMBER**
2644	5

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/592,575	MAKINO, ATSUSHI	
	Examiner	Art Unit	
	Devona E. Faulk	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 June 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *2 and 5* is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☒ Claim(s) *3 and 4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 June 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/592,575* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano et al. (U.S. Patent 6,222,930) in view of Tsubonuma et al. (U. S. Patent 5,604,809).

Regarding claim 1, Nakano discloses a sound reproducing system including a virtual image orientation processor (2) (see Figure 3) and a sound field that includes a listener (100) and left rear speaker (4a) and right rear speaker (4b). The virtual image orientation processor comprising audio signals S1a and S1b for left and right fear speakers; filters (211-214) are used for binaural processing and have for filter coefficients the acoustic transfer functions of H01L, H01R, H02L and H02R; filters (231-234) are used for crosstalk compensation processing (correction circuit); Although Nakano teaches on the above elements, he fails to teach of a sound field that includes a listener and a front (front of listener) left and right speaker. However the concept of a sound field comprising speakers located in front of the listener was well known in the art at the time of filing as taught by Tsubonuma. Tsubonuma discloses a sound field control systems comprising a sound field (F) where the left and right speakers are located in front of a hearing position (See Figure 1). Combining Nakano's virtual processor with Tsubonuma's sound field reads on " a correction circuit having given transfer functions, which audio device

supplies, through said correction circuit, right- and left- channel input audio signals on which head related transfer functions are superimposed, to right- and left-channel speakers located in front of a hearing position of a listener in a reproduction sound field space", "a first transfer function featured by a sound field characteristic of a space ranging from a left-channel speaker to the left ear of the listener when said left-channel speaker in an anechoic room as a model of a component layout in said reproduction sound field space", " a second transfer function featured by a sound field characteristic of a space ranging from a left-channel speaker to the right ear of the listener when said left-channel speaker in an anechoic room as a model of a component layout in said reproduction sound field space", " a third transfer function featured by a sound field characteristic of a space ranging from a right-channel speaker to the left ear of the listener when said right-channel speaker in an anechoic room as a model of a component layout in said reproduction sound field space", and "a fourth transfer function featured by a sound field characteristic of a space ranging from a right-channel speaker to the right ear of the listener when said right-channel speaker in an anechoic room as a model of a component layout in said reproduction sound field space. Using an inverse matrix of a matrix to obtain the correction transfer function of which the elements are the following first to fourth transfer functions are implanted in said correction circuit is a matter of choice. It is a calculation. It would have been obvious to use the inverse matrix for the benefit of determining the optimum impulse responses. It is well known in the art that anechoic rooms are used for experiments to evaluate human response to different kinds of sound fields and for experiments where sound reflections must be rendered negligible. It would have been obvious to combine Nakano's virtual processor and

Tsubonuma sound field and placing the device in an anechoic room in order to test for the best sound reproducing conditions.

Allowable Subject Matter

3. Claims 2 –5 are allowed.

4. The following is an examiner's statement of reasons for allowance:

Regarding claim 2, prior art Nakano (U. S. Patent 6,222,930) discloses a sound reproducing system comprising a virtual processor. Prior art Tsubonuma (U. S. Patent 5,604,809) discloses a sound field control system comprising a sound field where the left and right channel speakers are located in front of a hearing position of a listener. Prior art Elliot et al. (U.S. Patent 5,727,066) discloses sound reproducing systems comprising an inverse filter matrix. However, the prior art or combination thereof fails to teach on "said first transfer function is obtained from a third impulse response series, which is extracted from a second impulse response series of a first impulse response series, which said second impulse response series is featured by a sound field characteristic from a left-channel speaker to the listener when said left-channel speaker is disposed in an anechoic room as a model of a component layout in said reproduction sound field space, said first impulse response series being featured by a sound field characteristic of a space ranging from a left-channel speaker to the left ear of the listener when said left-channel speaker is disposed in said reproduction sound field space", "said second transfer function is obtained from a sixth impulse response series, which is extracted from a fifth impulse response series of a fourth impulse response series, which said fifth impulse response series is featured by a sound field characteristic of a space ranging from a left-channel speaker to the right ear of the listener

when said left-channel speaker is disposed in an anechoic room as a model of a component layout in said reproduction sound field space, said fourth impulse response series being featured by a sound field characteristic of a space ranging from a left-channel speaker to the right ear of the listener when said left-channel speaker is disposed in said reproduction sound field space"," said third transfer function is obtained from a ninth impulse response series, which is extracted from an eighth impulse response series of a seventh impulse response series, which said eighth impulse response series is featured by a sound field characteristic of a space ranging from a right-channel speaker to the left ear of the listener when said left-channel speaker is disposed in an anechoic room as a model of a component layout in said reproduction sound field space, said seventh response series being featured by a sound field characteristic of a space ranging from a right-channel speaker to the left ear of the listener when said right-channel speaker is disposed in said reproduction sound field space", and "said fourth transfer function is obtained from a 12th impulse response series, which is extracted from an 11th impulse response series of a 10th impulse response series, which said 11th impulse response series is featured by a sound field characteristic of a space ranging from aright-channel speaker to the right ear of the listener when said right-channel speaker is disposed in an anechoic room as a model of a component layout in said reproduction sound field space, said 10th response series being featured by a sound field characteristic of a space ranging from a right-channel speaker to the right ear of the listener when said right-channel speaker is disposed in said reproduction sound field space". As such, the prior art or combination thereof fails to disclose or make obvious the audio device as claimed.

Regarding claim 5, prior art Nakano (U. S. Patent 6,222,930) discloses a sound reproducing system comprising a virtual processor. Prior art Tsubonuma (U. S. Patent

5,604,809) discloses a sound field control system comprising a sound field where the left and right channel speakers are located in front of a hearing position of a listener. Prior art Elliot et al. (U.S. Patent 5,727,066) discloses sound reproducing systems comprising an inverse filter matrix. Prior art Gardner (U.S. patent 6,243,476) discloses a system for generating loudspeaker-ready binaural signals comprising a tracking system for detecting the position and preferably, the angle of rotation of a listener's head; and means responsive to the head tracking means, for generating the binaural signal. Prior art Henada et al. (U. S. Patent 5,982,903) discloses a memory for storing head related transfer functions. However, the prior art or combination thereof fails to disclose or make obvious "and position detecting means for specifying a hearing position of the listener in said a plurality of spatial regions, wherein said correction transfer functions stored in said storing means, the said correction transfer functions specified according to a hearing position of the listener detected by said position detecting means are implanted in said correction circuit" and ""correction transfer functions, which are obtained in accordance with a plurality of spatial regions". As such, the prior art or combination thereof fails to disclose or make obvious the audio device as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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